

i. Proposal number.# 2001-F210*

ii. Short proposal title.# Pesticides and metals in invertebrates and fish*

APPLICABILITY TO CALFED ERP GOALS AND IMPLEMENTATION PLAN

1a1. Link to ERP Strategic Goals: What Strategic Goal(s) is /are addressed by this proposal? List the letter(s) of all that apply.

A. At-risk species

B. Rehabilitate natural processes

C. Maintain harvested species

D. Protect-restore functional habitats

E. Prevent non-native species and reduce impacts

F. Improve and maintain water quality# A, E, C, F*

1a2. Describe the degree to which the proposal will contribute to the relevant goal. Quantify your assessment and identify the contribution to ERP targets, when possible.#

ERP Goal A - The proposal would contribute indirectly to information known about impacts of pesticides and metals on the endangered green sturgeon by performing feeding studies on white sturgeon, which is closely related. The proposal also includes feeding studies for chinook salmon (at-risk species) to determine impacts from pesticides and metals.

ERP Goal E - The study is directly related to the goal of reducing the impacts of the non-native clam species, *corbicula fluminea*. Clams can act as vector for the transfer of bioaccumulative substances to other fish species. This study will evaluate bioaccumulation of pesticides and metal in this clam species and determine the impacts on white sturgeon, a harvested species.

ERP Goal C - See Goal E. Project relates to white sturgeon. Provide information about bioaccumulation in white sturgeon.

ERP Goal F - Study looks at sediments as sinks for contaminants. Want to know how important contaminants can be re-mobilized and transferred to organism via sediment. Also looking at impacts of exposure of contaminants on invertebrates and fish that feed on them. Indirect or chronic effects can lead to decline in productivity in fish and invertebrates.

The project relates to ERP Target #11 (reduction of loadings of contaminants to Bay-Delta).*

1b. Objectives: What Strategic Objective(s) is/are addressed by this proposal? List Objective (from the table of 32 objectives) and describe potential contribution to ERP Goals. Quantify your assessment, when possible.#

The information from this study could be used towards accomplishing objectives and to develop management strategies for recovery, enhancement and restoration of sturgeon and chinook salmon.

Information could also be used to develop management strategies to reduce loadings of toxic contaminants.

Goal A, Objective #3 (contribute to recovery of at-risk native species)

Goal C, Objective #1 (enhance fisheries for salmonids, white sturgeon)

Goal F, Objective #1 (reduce loadings of toxic contaminants)*

1c. Restoration Actions: Does the proposal address a Restoration Action identified in Section 3.5 of the PSP? Identify the action and describe how

well the proposed action relates to the identified Restoration Action.# The study addresses restoration action #6 (Contaminants in the Central Valley). The PSP states that studies are needed on pesticide and trace metals toxicity to invertebrates and fish. The proposal directly relates to this action.*

1d. Stage 1 Actions: Is the proposal linked directly, indirectly or not linked to proposed

Stage 1 Actions? If linked, describe how the proposal will contribute to ERP actions during

Stage 1.# Environmental Water Quality

Stage 1 Action #5, 6,7 (support the ecological significance of pesticide discharges, conduct trace metal research, and selenium research). The project is directly linked.*

1e. MSCS: Describe how the proposal is linked to the Multi-Species Conservation Strategy and if it's consistent with the MSCS Conservation measures. Identify the species addressed and whether the proposal will

"recover", "contribute to recovery" or "maintain" each species.# The study may indirectly contribute to recovery of green sturgeon (see ERP Goal A discussion).*

1f. Information Richness/Adaptive Probing related to the proposal: Describe the degree to which the proposal provides information to resolve one of the 12 scientific uncertainties (Section 3.3 of the PSP), and whether the

proposal offers a prudent approach to answer these uncertainties.# Scientific Uncertainty 11 (Contaminants in the Central Valley) - The PSP describes the following data gaps under Scientific Uncertainty #11: need to evaluate contaminant exposures in the Delta, determine degree of exposure in aquatic organisms in the Delta (applies to pesticides, Hg, Se, and other trace metals), and investigate toxicity associated with sediments. This study will provide data to advance us towards answering these uncertainties.*

1g. Summarize comments from section 1a through 1f related to applicability to CALFED goals and priorities. Identify the strengths and weaknesses of the proposal, highlighting the applicability of the proposed project to CALFED and CVPIA goals and priorities. Focus on aspects of the proposal that may be important to later stages in the project review and selection

process.# The differences in feeding habits between salmon and white sturgeon are not described and therefore it is known how/whether the feeding studies would differ between the two species. There is some concern that the invertebrates used in the feeding studies are benthivorous and do not represent a significant (or any?) portion of food source for salmon in the Delta. The invertebrate species used for salmonids may be inappropriate.

There is some concern that the scope or focus of the study is too broad and covers too many compounds. The proposal to look at mixtures of compounds is even more complex. Staff suggests that the scope might be limited to either hydrophobic pesticides or heavy metals. CALFED Environmental Water Quality staff strongly supports the investigation of pyrethroids. Pyrethroids may ultimately replace chlorpyrifos and little is known about the acute and chronic effects of pyrethroids on invertebrate and fish species in the Bay-Delta and its watersheds.*

APPLICABILITY TO CVPIA PRIORITIES

1i. Describe the expected contribution to natural production of anadromous

fish. Specifically identify the species and races of anadromous fish that are expected to benefit from the project, the expected magnitude of the contribution to natural production for each species and race of anadromous fish, the certainty of the expected benefits, and the immediacy and duration of the expected contribution. Provide quantitative support where available (for example, expected increases in population indices, cohort replacement rates, or reductions in mortality rates).

The natural production of San Joaquin River fall-run chinook salmon and all races of Sacramento River-Basin chinook salmon, steelhead, white and green sturgeon, delta smelt, Sacramento splittail and various other species at all trophic levels in the Delta food web could benefit from this proposal. Although the effects of pesticides and heavy metals contamination in the aquatic environment has been documented as a causative agent in the decline of numerous populations of aquatic organisms the extent to which these contaminants affects aquatic species in the Delta is largely unknown. Therefore, neither the expected magnitude of the contribution to natural production nor the certainty of the expected benefits can be determined. This proposal will focus research on two anadromous fish species - white sturgeon and chinook salmon - as the higher trophic level organisms in the study of food chain transfer of heavy metals and pesticides from lower to higher trophic levels. The project is scheduled to cover the three-year period (Federal) FY 2000-2002, beginning October 2000. The project consists of five tasks. Task 1 will evaluate the bioaccumulation and transfer of sediment-bound heavy metals and pesticides to two predator species - white sturgeon and chinook salmon - from two invertebrate prey species, an amphipod and a freshwater clam species that accumulate the contaminants in their tissues. Tasks 2 and 3 will evaluate the effect of the contaminants on the population structure and on health parameters (biomarkers) in populations of the two invertebrate species. Task 4 will determine the effects of the dietary exposure to the contaminants on the two prey species. Task 5 will result in a report on the recommendations for pollutant management and monitoring. The final report is to be delivered at the end of the third year. Therefore, the immediacy of the expected contribution (i.e. utilization of the information developed in this proposal) will be realized three fiscal years after the work in the proposal is initiated. The duration of the expected contribution cannot be determined until the research is completed.*

1j. List the threatened or endangered species that are expected to benefit from the project. Specifically identify the status of the species and races of anadromous fish that are expected to benefit from the project, any other special-status species that are expected to benefit, and the ecological community or multiple-species benefits that are expected to occur as a result of implementing the project.

Listed species, anadromous species and special status species with greatest residence time in the Delta/Estuary such as delta smelt and Sacramento splittail would be expected to be at greatest risk of exposure to pesticides and heavy metals uptake; species such as steelhead and chinook salmon that typically have short residence time in the Delta/Estuary would be expected to be at lower risk. White sturgeon and chinook salmon splittail would be expected to particularly benefit from this proposal, since these species will be selected for the research of heavy metals and pesticides transfer in the food chain from invertebrate prey to vertebrate predators. Other related species of fish such as green sturgeon and steelhead may accrue similar benefits from the project.*

1k. Identify if and describe how the project protects and restores natural channel and riparian habitat values. Specifically address whether the project protects and restores natural channel and riparian habitat values, whether the project promotes natural processes, and the immediacy and duration of benefits to natural channel and riparian habitat values.

This project would protect and restore natural channel values and promote natural processes if the products to be developed in this project could ultimately be used in the implementation of measures to eliminate toxic effects associated with the presence of pesticides and heavy metals in the aquatic environment. The pesticides and heavy metals contamination research in this proposal is directed at food web transfer mechanisms, identification of forms

of selenium that can be readily identified in assays and critical concentrations of selenium in fish. In order to provide benefits from this research, pesticides and heavy metals eradication/neutralization techniques would have to be implemented; such implementation will not occur in this proposal. The proposal will conclude all work over a three-year period, beginning in October 2000. Therefore, the immediacy of the expected contribution (i.e. final report) will be realized three fiscal years after the work in the proposal is initiated. The duration of the expected contribution cannot be determined until the project is completed and all reports and data developed in the project become available.*

1l. Identify if and how the project contributes to efforts to modify CVP operations. Identify the effort(s) to modify CVP operations to which the proposed project would contribute, if applicable. Efforts to modify CVP operations include modifications to provide flows of suitable quality, quantity, and timing to protect all life stages of anadromous fish as directed by Section 3406 (b)(1)(B) of the CVPIA, including flows provided through management of water dedicated under Section 3406(b)(2) and water acquired pursuant to Section 3406(b)(3).# No evidence is presented to indicate whether/how the project would contribute to efforts to modify CVP operations. No such relationship is apparent.*

1m. Identify if and how the project contributes to implementation of the supporting measures in the CVPIA. Identify the supporting measure(s) to which the proposed project would contribute, if applicable. Supporting measures include the Water Acquisition Program, the Comprehensive Assessment and Monitoring Program, the Anadromous Fish Screen Program, and others.# The project does not obviously contribute to implementation of the supporting measures in the CVPIA.*

1n. Summarize comments from section 1i through 1m related to applicability to CVPIA priorities (if applicable, identify the CVPIA program appropriate to consider as the source of CVPIA funding [for example, the Anadromous Fish Restoration Program, Habitat Restoration Program, Water Acquisition Program, Tracy Pumping Plant Mitigation Program, Clear Creek Restoration Program, Comprehensive Assessment and Monitoring Program, and Anadromous Fish Screen Program]). Identify the strengths and weaknesses of the proposal, highlighting the applicability of the proposed project to CALFED and CVPIA goals and priorities. Focus on aspects of the proposal that may be important to later stages in the project review and selection process.# This project is appropriate for funding support from the Anadromous Fish Restoration Program. The project could contribute to meeting the goal of the Anadromous Fish Restoration Program to increase the natural production of anadromous fish by reducing the toxic affects of pesticides and heavy metals contamination in the Delta. The project findings could provide a better understanding of the significance of dietary exposures and sublethal toxic effects of sediment - associated heavy metals and pesticides to invertebrate white sturgeon and chinook salmon. These results may be extrapolated to other fish species feeding on the same food sources. The results will also provide a basis for assessing potential impacts on other fish species, based on contaminant concentrations in their food source, thus providing managers with better information to design monitoring programs and perform risk assessments. The proposal is consistent with Central Valley-Wide Action No.3 (Reduce toxic chemical and trace element.) in the Revised Draft Restoration Plan for the Anadromous Fish Restoration Program, May 30, 1997; this is identified as a high priority in the draft plan. The strength of the proposal is that the entire process from evaluation of the problem to the development of potential solutions will be done in one contiguous effort and under the singular control of one program manager. The weakness of the proposal is that it will only produce information to be used in ultimately implementing actions to remediate/neutralize concentrations of pesticides and/or heavy metals in the Delta aquatic environment. There is no guarantee if/when funding to implement these measures will be secured.*

RELATIONSHIP TO OTHER ECOSYSTEM RESTORATION PROJECTS

2a. Did the applicant explain how the proposed project relates to other past and future ecosystem restoration projects, as required on page 57 in the PSP? Type in yes or no.#yes*

2b. Based on the information presented in the proposal and on other information on restoration projects available to CALFED and CVPIA staff, describe how the proposed project complements other ecosystem restoration projects, including CALFED and CVPIA. Identify projects or types of projects that the proposed project would complement, now or in the future. Identify source of information.

#Several ongoing CALFED projects have goals complementary to this project, including UCD projects listed under 3A, and USGS projects studying contaminants and particulate transfer through the Delta. Additional toxicity studies funded by CALFED are also complementary to the project, many designed to reduce toxicity in the watershed. Information from this project may help identify thresholds of toxicity levels in order to refine contamination reduction goals. Information source: Proposal, CALFED tracking table.*

RESULTS AND PROGRESS ON PREVIOUSLY FUNDED CALFED AND CVPIA PROJECTS, INCLUDING REQUESTS FOR NEXT-PHASE FUNDING

3a1. Based on the information presented in the proposal and on project reports and data available to CALFED and CVPIA staff, has the applicant previously received CALFED or CVPIA funding? Type CALFED, CVPIA, both, or none.#CALFED*

3a2. If the answer is yes, list the project number(s), project name(s) and whether CALFED or CVPIA funding. If the answer is none, move on to item 4.#CALFED

97C06- Contaminant Effects on Smelt

99N07- Chronic Toxicity of Environmental Contaminants in Sacramento Splittail - A Biomarker Approach

98C02 and 00B03 - Culture of Delta Smelt

97C05 - Effects of Wetlands Restoration on Methyl Mercury Levels

97-C12 - Alternative Practices for Reducing Pesticide Impacts on Water Quality

98C15 and 00B06 - Biological Assessment of Green Sturgeon in the Sacramento-San Joaquin Watershed

99F06 - Reducing Risk of Importation and Distribution of Non-native Invasive Species through Outreach and Education

00F08 - McCormack Williamson Tract Phase II Monitoring Project

99N02 - Fish Treadmill Developed Fish Screen Criteria for Native Sacramento-San Joaquin Watershed Fishes

99N05 - Reintroduction of Endangered Soft Bird's Beak to Restored Habitat

99N06 - Linked Hydrogeomorphic Ecosystem Models to Support Adaptive Management

99N07 - Chronic Toxicity of Environmental Contaminants in Sacramento Splittail - A Biomarker Approach

If the answer is no, move on to item 4.*

3b1. Based on the information presented in the proposal and on project reports available to CALFED and CVPIA staff, did the applicant accurately state the current status of the project(s) and the progress and accomplishments of the project(s) to date? Type yes or no.#yes*

3b2. If the answer is no, identify the inaccuracies: #

3c1. Has the progress to date been satisfactory? Type yes or no.#yes*

3c2. Please provide detailed comments in support of your answer, including source of information (proposal or other source): #UCD projects initially experienced significant delays in getting contracts negotiated and signed, but are now all progressing well and producing some preliminary results. 98C02 and 98C15 are completed first phases, which are now undertaking the second phase of work. Information source: Proposal, CALFED progress reports, Final first year analyses reports.*

REQUESTS FOR NEXT-PHASE FUNDING

3d1. Is the applicant requesting next-phase funding? Type yes or no.#no*

3d2. If the answer is yes, list previous-phase project number(s) here. If the answer is no, move on to item 4.#*

3e1. Does the proposal contain a 2-page summary, as required on pages 57 and 58 of the PSP? Type yes or no.#*

3e2. Based on the information presented in the summary and on project reports available to CALFED and CVPIA staff, is the project ready for next-phase funding? Type yes or no.#*

3e3. Please provide detailed comments in support of your answers, including source of information (proposal or other source): #*

LOCAL INVOLVEMENT

4a. Does the proposal describe a plan for public outreach, as required on page 61 of the PSP? Type yes or no.# No.*

4b. Based on the information in the proposal, highlight outstanding issues related to support or opposition for the project by local entities including watershed groups and local governments, and the expected magnitude of any potential third-party impacts.# Letters of support for this project were received from six different scientists at UC Davis, and scientists from three Federal agencies, one state agency, and the Director of Research of the California Prune Board. All these scientists are aware of the potential value of the findings of this research proposal and consequently have endorsed the proposed work.*

ENVIRONMENTAL COMPLIANCE

4d. List any potential environmental compliance or access issues as identified in the PSP checklists.# They are assuming they will be working under the DWR permits. This is not true. They need to comply with CEQA and obtain their own permits if they are taking samples beyond what is stated in the DWR permit and monitoring plan. Depending on location and timing of sampling, take permits need to be acquired.*

4e. Specifically highlight and comment on any regulatory issues listed above that may prevent the project from meeting the projected timeline.# None.*

COST

5a. Does the proposal include a detailed budget for each year of requested support? Type yes or no.# yes*

5b. Does the proposal include a detailed budget for each task identified? Type yes or no.# yes*

5c. Is the overhead clearly identified? Type yes or no.# yes*

5d. Are project management costs clearly identified? Type yes or no.# yes*

5e. Please provide detailed comments in support of your answers to questions 5a - 5d.# All information requested has been provided by project proponent in a clear, concise, and understandable format.*

COST SHARING

6a. Does the proposal contain cost-sharing? Type yes or no.# no*

6b. Are applicants specifically requesting either state or federal cost share dollars? Type state, federal, or doesn't matter.# federal*

6c. List cost share given in proposal and note whether listed cost share is identified (in hand) or proposed.

6c1. In-kind:# n/a*

6c2. Matching funds:# n/a*

6c3. Show percentage that cost sharing is of total amount of funding requested along with calculation.# n/a*

6d. Please provide detailed comments in support of your answers to questions 6a - 6c3.# n/a*